

TYPHOON MAC (17) AND
TROPICAL STORM NANCY (18)

Typhoon Mac developed from a weak surface circulation northeast of Yap in September 1979. This circulation tracked westward, reaching tropical storm intensity by 160000Z. Mac followed the climatological intensification rate for tropical cyclones approaching the Philippines and reached typhoon intensity prior to making landfall. Frictional effects caused Mac to weaken slowly as he tracked across southern Luzon towards the South China Sea. The unexpected development of Tropical Storm Nancy east of Hai-nan Island influenced Mac's track in the South China Sea.

JTWC's real-time forecasts do not always reflect the actual intensity of a tropical cyclone. Rapid intensification or weakening, peripheral data unavailable due to geographical restrictions, and tight maximum wind bands, which are not initially detected, all reduce the accuracy of intensity estimates provided in tropical cyclone warnings. These intensity discrepancies often go unrecognized until discovered during post-analysis, as in the case of Typhoon Mac.

Reanalysis of aircraft reconnaissance data from 16-18 September indicates that Mac most probably intensified to typhoon intensity by 161800Z. During the period 16-18 September, aircraft reconnaissance at 160503Z reported 68 kt (35 m/sec) at 1500 ft (457 m) and 60 kt (31 m/sec) on the surface prior to encountering moderate turbulence which forced the aircraft to climb through the overcast stratocumulus cloud layer above. Subsequent reconnaissance data at 170810Z confirmed typhoon intensity by locating 80-90 kt (41-46 m/sec) surface winds in a 10-nm (19 km) wide band tucked under the strong eastern feederband. Mac made landfall prior to the next scheduled aircraft fix with geographical constraints severely reducing peripheral data collection.

Although real-time data were available which indicated Mac had possibly reached typhoon intensity, the isolated reports of strong winds were dismissed as gusts associated with lower velocity sustained winds. (Aircraft data are occasionally not used verbatim when they fall outside reasonable limits after being analyzed with available surface reports, satellite data intensity estimates and the JTWC Maximum-Wind Minimum-Pressure Relationship (Atkinson and Holliday, 1977).) During post-analysis, the reconnaissance data were re-examined using an intensity study of tropical cyclones crossing the Philippines (Sikora, 1976). For typhoons with maximum sustained winds of less than 80 kt (41 m/sec), the study shows that an average intensification of 30 kt (15 m/sec) can be expected for tropical cyclones which follow a track similar to Mac's. Reanalysis of the period between 151800Z and 180000Z shows, in fact, that Mac intensified to typhoon intensity before weakening from frictional effects over Catanduanes Island on 18 September (Fig. 3-17-1).

The unexpected development of a second tropical cyclone in the South China Sea (SCS) produced a series of track and intensity modifications in Typhoon Mac. Upon exiting the Philippines, Mac, which was originally forecast to track west-northwest into the SCS, began a Fujiwhara interaction (Fig. 3-18-2) with the rapidly developing Tropical Storm Nancy located near Hai-nan Island. Instead of tracking west-northwest, Mac tracked north-northwest, skirting Cubi Point Naval Air Station, Philippines, on his new track toward Hong Kong. Strong anticyclonic outflow from Nancy sheared Mac's convection towards the southwest with aircraft reconnaissance reporting an exposed low-level circulation of 30-35 kt (15-18 m/sec) intensity on the 20th.

Weak steering currents allowed Nancy to take a cyclonic track across southern Hai-nan Island before heading southwestward into Vietnam. Nancy's southwestward track towards landfall forced Mac further north than originally forecast. Mac eventually passed just south of Hong Kong. Ironically, Nancy's development, which caused Mac to track towards Hong Kong, also helped to spare Hong Kong from potential typhoon force winds. Nancy's upper-level outflow, which dominated the SCS from 19-23 September, produced strong vertical shear over Mac and slowed his rate of reintensification. Typhoon Mac only reached minimal tropical storm intensity prior to making landfall west of Hong Kong.

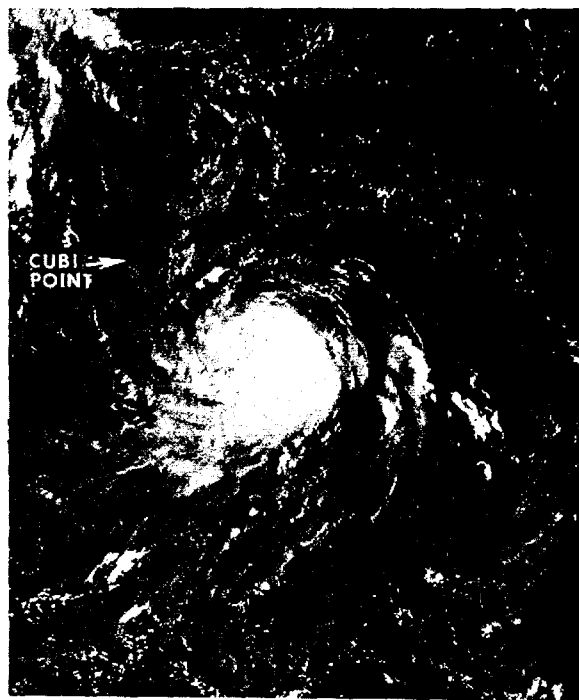
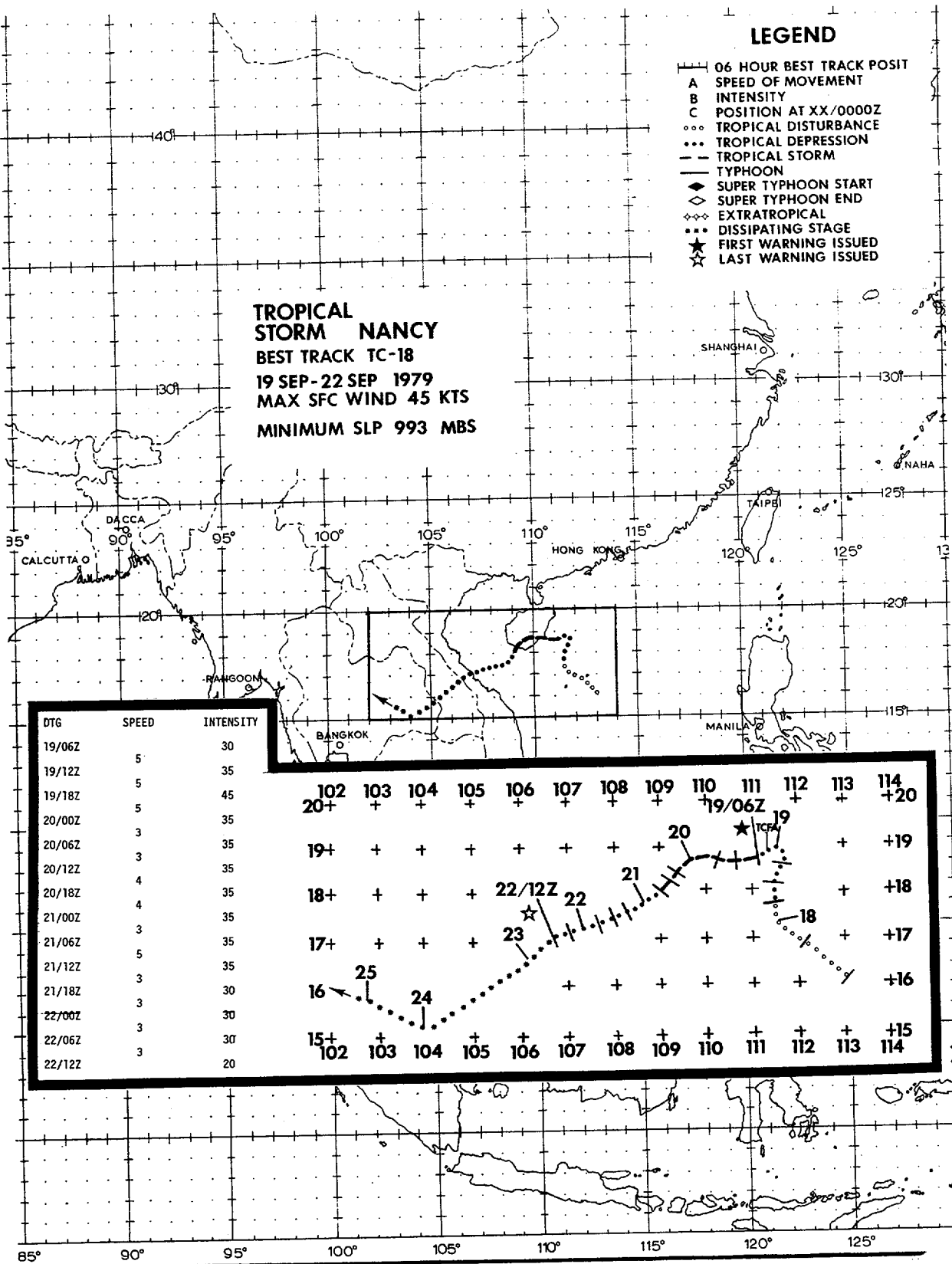


FIGURE 3-17-1. Typhoon Mac after crossing Catanduanes Island, Philippines, 18 September 1979, 0038Z. (DMSP imagery)

LEGEND

- 06 HOUR BEST TRACK POSIT
- A SPEED OF MOVEMENT
- B INTENSITY
- C POSITION AT XX/0000Z
- ... TROPICAL DISTURBANCE
- ... TROPICAL DEPRESSION
- TROPICAL STORM
- TYPHOON
- ◆ SUPER TYPHOON START
- ◇ SUPER TYPHOON END
- ◆◆ EXTRATROPICAL
- ... DISSIPATING STAGE
- ★ FIRST WARNING ISSUED
- ☆ LAST WARNING ISSUED

TROPICAL STORM NANCY
BEST TRACK TC-18
19 SEP-22 SEP 1979
MAX SFC WIND 45 KTS
MINIMUM SLP 993 MBS



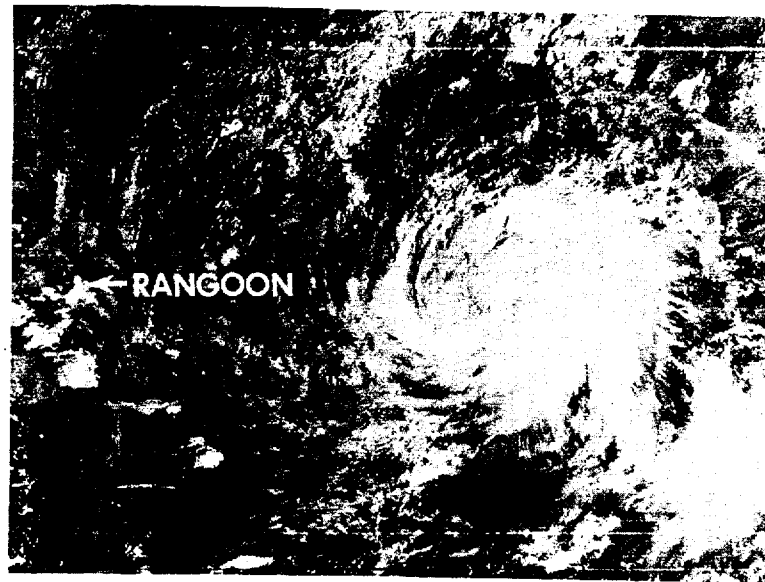


FIGURE 3-18-1. Tropical Storm Nancy at 35 kt (18 m/sec) intensity just after landfall on the southern end of Hai-nan Island, 20 September 1979, 0143Z. (DMSP imagery from Det 8, 1WW, Kadena AB, Okinawa)

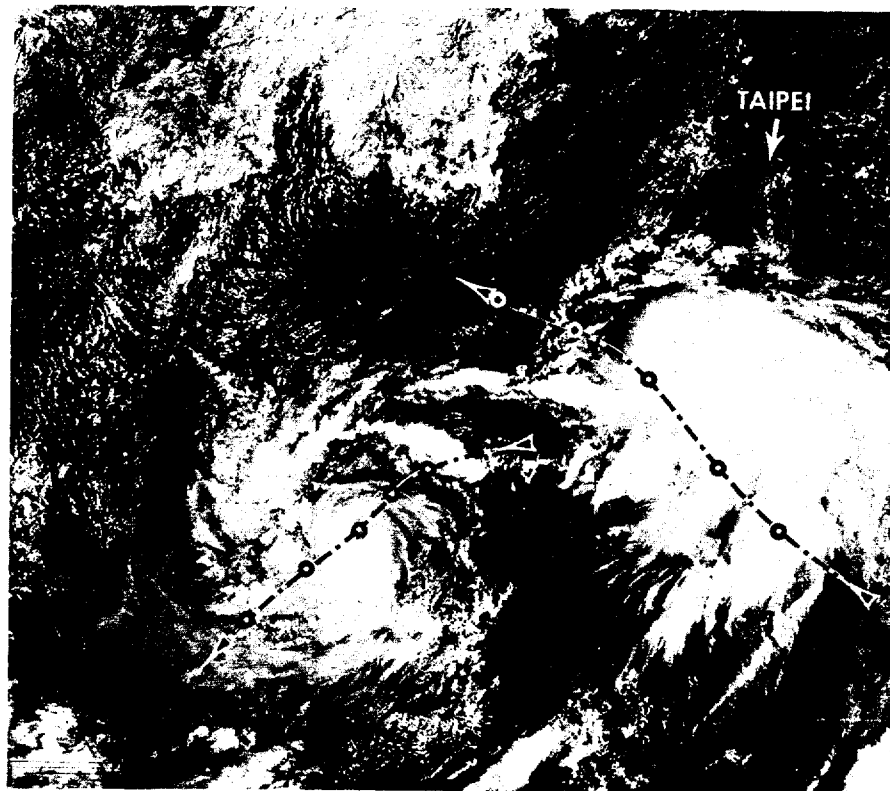


FIGURE 3-18-2. Typhoon Mac and Tropical Storm Nancy undergoing Fujiwhara interaction over the South China Sea, 22 September 1979, 0302Z. The 48-hour tracks before and after picture time are superimposed (Dots bracket 24-hour intervals). (DMSP imagery from Det 5, 1WW, Clark AB, RP)